Atlantic Richfield Company

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April 10, 2012

Mr. Gary Riley
US EPA Region 9
75 Hawthorne Street
San Francisco, CA 94105

Mr. Kevin Mayer
US EPA Region 9
75 Hawthorne Street
San Francisco, CA 94105

RE: Leviathan Monthly Report for March 2012 and Quarterly RI/FS Progress Report

Dear Mr. Riley and Mr. Mayer:

The following text describes activities conducted during the month of March 2012 at the Leviathan Mine Site and activities anticipated to occur during the upcoming month. These activities are organized by work area [Aspen Seep, Channel Underdrain (CUD) and Delta Seep (DS)], and site-wide tasks. This progress report is being submitted in accordance with Paragraph 62 of the Administrative Settlement Agreement and Order on Consent for Removal Action (AOC) (effective January 21, 2009).

Atlantic Richfield is also submitting this letter in satisfaction of the quarterly progress reporting requirement set forth in Paragraph 63 of the Administrative Order for Remedial Investigation and Feasibility Study (U.S. EPA Region IX, CERCLA Docket No. 2008-18, June 23, 2008) (UAO). The quarterly summary of RI/FS activities is provided at the end of this letter.

ACTIVITIES FOR MARCH

Aspen Seep

- Operated the Aspen Seep Bioreactor (ASB) in recirculation mode during the month of March. Routine O&M, influent sampling, and effluent sampling occurred on March 8, 2012. The currently available influent and effluent water quality data for the March 8, 2012 sampling event are presented in Table 1. Recent pH and ORP field data are summarized in Table 2. No new influent flow rate data have been received from the USGS since the Monthly Report for January 2012. Any new flow data received will be included in subsequent monthly reports.

CUD and DS

- The HDS Treatment Plant and CUD and DS capture equipment remained winterized during the month of March.
- On March 23, 2012 Atlantic Richfield submitted a letter to EPA summarizing Atlantic Richfield's plans for access, commissioning, and startup of the HDS Treatment System and requesting authorization to perform water treatment during the 2012 Winter/Spring Portion of the Limited Access Season. On April 2, 2012, EPA provided a letter authorizing Atlantic Richfield to proceed.

Site-wide

- Work continued on updating the Leviathan Mine Project Database with data from monitoring performed by Atlantic Richfield and various agencies.
- Continued compiling information for the 2011 Annual Completion Report: Channel Underdrain, Delta Seep, and Aspen Seep Water Treatment Activities (due April 10, 2012).
- On March 1, 2012, Atlantic Richfield submitted the 2012 Removal Action Work Plan (RAWP) to EPA, which describes response actions to be performed by Atlantic Richfield pursuant to the AOC at the Leviathan Site during 2012. On April 2, 2012, EPA provided approval and direction to implement the 2012 RAWP, subject to EPA's comments.
- On March 20, 2012, a conference call was conducted with EPA to provide a general progress update.
- On March 30, 2012, Atlantic Richfield submitted the 2012 Annual Road Operating Plan to the Forest Service.

ACTIVITIES FOR UPCOMING MONTH

Aspen Seep

- Continue operation of the ASB in recirculation mode and conduct winter access monitoring and maintenance as outlined in the 2012 RAWP.

CUD and DS

- Perform road maintenance and snow removal activities as necessary for the winter/spring portion of the 2012 Limited Access Season.
- Begin site setup activities in the Pond 4 area for the winter/spring portion of the 2012 Limited Access Season operations, weather and safe access conditions permitting.

Site-wide

- Continue to provide project progress updates to EPA via conference call. The next conference call is currently scheduled for April 17, 2012.
- Submit the 2011 Annual Completion Report: Channel Underdrain, Delta Seep, and Aspen Seep Water Treatment Activities to EPA.

* * * *

Quarterly RI/FS Progress Report

As required by Paragraph 63 of the UAO, the following Quarterly Progress Report for Remedial Investigation and Feasibility Study (RI/FS) activities describes: (a) the actions taken to comply with the UAO during the prior quarter, (b) the work planned for the next quarter, and (c) any problems encountered or anticipated including any actual or anticipated delays in schedules.

Actions Taken to Comply with the UAO

- Atlantic Richfield submitted the Quarterly Progress Report for the fourth quarter 2011 on January 10, 2012.
- Atlantic Richfield conducted Monthly Progress Conference Calls with EPA in January, February and March 2012, during which RI/FS updates were provided.
- Atlantic Richfield continued evaluation of data collected in 2011 and refinement to the conceptual model necessary to evaluate the Feasibility of a Subsurface Barrier at the Upper Tributary.
- Atlantic Richfield submitted a response to comments on the Reference FRI Work Plan on February 3, 2012.
- Atlantic Richfield conducted a teleconference with EPA and other stakeholders to present an overview of the Off-Property FRI Work Plan on February 22, 2012.
- Atlantic Richfield submitted the Ecological Risk Assessment Work Plan and Revised Problem Formulation to EPA on March 20, 2012.
- Atlantic Richfield conducted a teleconference with EPA and their technical consultants to discuss EPA's comments on the Off-Property FRI Work Plan on March 13, 2012.

Work Planned for the Next Quarter

- As discussed in a conference call with EPA on April 4, 2012, Atlantic Richfield plans to submit an Addendum to the Off-Property FRI Work Plan to EPA following the receipt of EPA comments on the Off-Property FRI Work Plan submitted on February 8, 2012.
- As discussed in the April 4, 2012 conference call with EPA, Atlantic Richfield plans to submit a letter summarizing a proposed surface water monitoring program to be implemented in 2012 for EPA approval.
- As described in the February 3, 2012 response to comments on the Reference Area FRI Work Plan, Atlantic Richfield plans to submit a revised version of the Reference Area FRI Work Plan. The revised version of the Reference Area FRI Work Plan is targeted for completion after the receipt of written comments on the Off-Property FRI Work Plan anticipated early in the 2nd quarter of 2012.
- Atlantic Richfield plans to resume implementation of field investigation activities under the EPA approved On-Property FRI Work Plan in the second quarter of 2012.
- Atlantic Richfield plans to initiate field investigation activities under the Addendum to the Off-Property FRI Work Plan following EPA approval (anticipated to occur during second quarter).

- Atlantic Richfield plans to notify EPA of planned field investigation activities by providing a "Three-week Look Ahead" of upcoming work.
- Atlantic Richfield plans to prepare an Addendum to the On-Property FRI Work Plan for the collection of additional data to complete the characterization of the Upper Tributary area necessary to evaluate the Feasibility of a Subsurface Barrier at the Upper Tributary.
- Atlantic Richfield plans to submit the 2011 RI/FS Data Summary Report to EPA in May 2012. This report will summarize the RI data collected during the 2011 field season.
- Atlantic Richfield will submit the Quarterly Progress Report for the second quarter of 2012 on July 10, 2011.

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If you have any questions or comments, please feel free to contact me at (714) 228-6770 or via e-mail at Anthony.Brown@bp.com.

Sincerely,

ORIGINAL SIGNED BY DAVE MCCARTHY FOR TONY BROWN

Tony Brown
Project Manager

Attachments:
Table 1 – Aspen Seep Bioreactor Treatment System – Sample Results
Table 2 – Aspen Seep Bioreactor Treatment System – Recent pH and ORP Field Measurements

cc: Chuck Curtis, Lahontan Regional Water Quality Control Board
Ronald Halsey, Atlantic Richfield Company
Nathan Block, Esq., BP America Inc.
Adam Cohen, Esq., Davis Graham & Stubbs LLP
Dave McCarthy, Copper Environmental Consulting
Marc Lombardi, AMEC Environment & Infrastructure, Inc.
Grant Ohland, AMEC Environment & Infrastructure, Inc.
Sandy Riese, EnSci, Inc.

TABLE 1
ASPEN SEEP BIOREACTOR TREATMENT SYSTEM - SAMPLE RESULTS
MARCH 2012 MONTHLY SUMMARY
Draft - Provisional Data

Parameter	Basis	March 08 2012 169ASPINF597 Influent (mg/L)	March 08 2012 169ASPEFF596 Effluent (mg/L)	Maximum Discharge (mg/L)	Average Discharge (mg/L)
pH (s.u.)	Field	2.43	8.47	-	6.0 - 9.0
Selenium	Total	<0.0010	0.00096 J	NP	0.005
Aluminum	Dissolved	44	0.61	4.00	2.00
Arsenic	Dissolved	<0.0018	<0.00090	0.34	0.15
Calcium	Dissolved	350	280	-	-
Cadmium	Dissolved	0.0019 J	<0.00010	0.009	0.004
Chromium	Dissolved	0.0036 J	<0.00090	0.97	0.31
Copper	Dissolved	0.85	0.0051	0.026	0.016
Hardness	Dissolved	1,200	900	-	-
Iron	Dissolved	130	0.028 J	2.00	1.00
Magnesium	Dissolved	88	46	-	-
Lead	Dissolved	<0.00040	<0.00020	0.136	0.005
Nickel	Dissolved	0.47	0.0088	0.84	0.094
Zinc	Dissolved	0.67	<0.0040	0.21	0.21
Chloride	Total	<2.0	2.2 J	-	-
Acidity	Total	600	<2.0	-	-
Alkalinity (Total)	Total	<4.0	130	-	-
Alkalinity (Bicarbonate)	Total	<4.8	160	-	-
Alkalinity (Carbonate)	Total	<2.4	2.4	-	-
Alkalinity (Hydroxide)	Total	<1.4	<1.4	-	-
Sulfate	Total	2,100	1,400	-	-
Total Dissolved Solids	Total	2,400	2,300	-	-
Total Suspended Solids	Total	33	<10	-	-

Abbreviations

< - Analyte not detected at or above the or method detection limit

- - Discharge criteria not established

J - Estimated value; analyte detected at a level less than the Reporting Limit and greater than or equal to the Method Detection Limit

mg/L - milligrams per liter

NP - Not Promulgated

TABLE 2
ASPEN SEEP BIOREACTOR TREATMENT SYSTEM - RECENT pH and ORP FIELD MEASUREMENTS
MARCH 2012 MONTHLY SUMMARY
Draft - Provisional Data

Date	Aspen Seep Bioreactor Influent[1]			Manhole 1 or 2 (Biocell 1 Influent)		Manhole 4 or 5 (Biocell 1 Effluent/Biocell 2 Influent)		Manhole 6 (NaOH dosing location)		Manhole 7 or 9 (Biocell 2 Effluent)		Aspen Seep Bioreactor Effluent	
	Flow (gpm)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)
09/21/07	6.0	2.91	428.9	7.34	-268.4	7.13	-280.3	9.56	-285.8	7.13	-265.3	8.42	2.6
09/26/07	6.2	2.89	496.7	7.80	-192.1	7.36	-223.0	9.64	-195.4	7.34	-232.7	8.34	50.3
10/03/07	5.5	2.85	484.1	8.07	-127.7	8.50	-129.6	11.25	-136.5	7.64	-164.0	8.22	-5.2
10/10/07[2]	5.8	2.80	498.0	5.50	55.9	5.64	-70.5	10.00	-190.0	6.20	-171.6	7.78	-268.0
10/18/07[2]	5.9	2.83	482.4	5.00	26.8	5.68	-46.2	11.38	-112.0	6.23	-139.0	8.69	135.0
10/31/07[2]	9.0	2.88	402.7	4.26	319.3	6.85	-156.7	9.80	-170.0	6.95	-212.2	7.66	-94.3
11/08/07	6.0	2.88	418.0	7.55	-128.3	7.01	-116.7	8.23	-133.9	6.86	-125.8	7.51	-50.6
11/13/07	-	2.86	484.5	7.06	-2.3	6.84	-65.3	7.86	-42.6	6.79	-78.1	7.58	4.2
11/27/07	5.5	2.86	479.4	6.99	-38.5	6.97	-205.0	8.46	-183.9	6.91	-156.8	7.25	-1.7
12/12/07	-	3.01	482.2	7.20	-25.3	7.20	-115.2	7.64	-107.7	7.04	-129.7	6.90	-31.9
01/15/08	4.8	2.98	483.3	6.76	5.9	6.73	-85.5	7.89	-94.3	6.67	-137.4	6.71	-33.0
02/07/08[3]	-	-	-	-	-	-	-	-	-	-	-	5.77	20.2
02/12/08	7.0	2.76	487.4	6.67	44.6	-	-	7.39	-45.6	6.42	-88.0	6.70	-15.3
03/18/08	6.0	2.88	375.1	7.85	3.6	-	-	8.80	-189.2	7.23	-211.3	7.05	-95.3
04/10/08	7.5	2.90	397.7	6.74	-80.0	6.70	-163.4	7.50	-142.6	6.57	-165.3	7.39	-24.5
05/15/08	7.3	2.97	442.2	6.24	21.2	6.55	-265.4	6.55	-233.7	5.60	-183.7	7.29	-143.3
05/27/08	7.0	3.00	464.1	7.11	-16.3	6.85	-242.2	6.98	-191.1	6.80	-235.2	7.26	-19.5
06/09/08	7.0	3.10	455.4	7.40	-47.5	7.09	-251.2	7.70	-178.8	6.97	-219.7	7.19	-61.5
06/17/08	7.5	2.91	443.9	7.42	-22.7	6.90	-283.0	7.29	-131.0	6.88	-244.3	7.30	-82.5
07/10/08	7.3	2.98	470.9	7.32	-34.1	6.90	-238.4	7.05	-172.6	6.90	-215.0	7.85	-113.5
07/22/08	7.0	2.99	455.5	6.94	-272.5	6.97	-267.4	7.07	-190.6	7.01	-248.9	7.35	-89.1
08/04/08	6.8	2.89	450.7	7.60	-94.4	6.94	-266.0	6.19	-173.1	7.02	-251.2	-	-
08/05/08	-	3.05	445.3	-	-	-	-	-	-	-	-	7.29	-70.0
08/18/08	7.3	3.93	478.9	7.46	-166.7	7.08	-291.9	7.40	-202.6	7.07	-268.8	7.40	-52.4
08/22/08	-	2.89	473.7	7.97	-212.9	7.08	-301.8	7.74	-224.0	7.03	-275.9	7.67	-27.8
08/25/08	-	2.93	470.5	7.77	-287.7	7.18	-286.1	6.89	-205.6	7.12	-273.8	8.02	-108.4
08/26/08	-	2.91	468.8	7.95	-255.4	7.09	-305.4	7.75	-281.2	7.14	-273.1	7.77	-41.4
09/24/08	-	3.03	423.2	7.18	-107.8	6.99	-255.4	7.11	-205.7	6.89	-245.2	7.70	-87.7
09/30/08	-	3.02	434.3	7.77	-151.9	6.89	-267.5	-	-	6.92	-269.9	8.10	-94.0
10/13/08	5.8	3.34	433.1	7.17	-98.7	6.94	-218.3	6.80	-157.2	7.01	-206.1	8.32	-101.0
10/27/08	5.8	3.21	247.8	7.34	-162.5	6.96	-175.3	7.20	-152.3	6.98	-126.8	7.88	273.7
11/19/08	5.5	2.83	453.7	7.20	-104.5	6.77	-204.7	7.12	-82.2	6.71	-154.7	7.74	-35.1
12/03/08	5.3	3.56	453.0	7.23	-45.0	6.86	-141.3	7.06	-100.1	6.84	-135.6	7.65	-47.5
01/9/09[4]	-	3.15	458.3	-	-	-	-	-	-	-	-	6.95	-43.0
01/12/09	5.3	2.94	466.3	6.36	-82.8	6.38	-245.1	-	-	6.82	-259.0	7.11	-74.0
02/19/09[4]	5.3	2.78	480.1	6.60	-3.2	6.74	-145.1	7.26	-117.6	6.25	-162.3	6.68	-18.1
03/10/09	5.0	2.88	481.2	-	-	-	-	-	-	-	-	7.36	34.3
04/13/09	7.0	2.78	532.7	7.45	-9.9	7.04	-185.5	7.50	-65.8	6.98	-175.4	7.77	-32.2
05/06/09	5.5	2.89	444.4	-	-	6.47	-221.3	-	-	6.56	-206.5	7.62	-86.6
06/03/09	6.5	2.91	445.9	6.98	-145.1	6.62	-260.8	7.07	-192.8	6.65	-260.4	7.55	-15.4

TABLE 2
ASPEN SEEP BIOREACTOR TREATMENT SYSTEM - RECENT pH and ORP FIELD MEASUREMENTS
MARCH 2012 MONTHLY SUMMARY
Draft - Provisional Data

Date	Aspen Seep Bioreactor Influent[1]			Manhole 1 or 2 (Biocell 1 Influent)		Manhole 4 or 5 (Biocell 1 Effluent/Biocell 2 Influent)		Manhole 6 (NaOH dosing location)		Manhole 7 or 9 (Biocell 2 Effluent)		Aspen Seep Bioreactor Effluent	
	Flow (gpm)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)
06/16/09	6.5	2.98	388.0	7.09	-186.6	6.79	-319.3	7.16	-233.2	6.80	-298.2	7.70	-158.1
07/01/09	6.0	2.95	376.5	7.43	376.5	6.93	-366.2	7.42	-310.8	6.97	-350.5	7.89	-189.6
07/14/09	5.8	2.97	394.4	-	-	6.85	-338.8	-	-	6.98	-331.9	7.90	-146.2
07/29/09	6.0	2.78	404.5	7.24	-175.5	7.39	-427.7	8.10	-260.2	7.29	-403.7	8.05	-135.6
08/05/09	5.5	2.89	433.8	-	-	-	-	8.73	-120.7	-	-	8.17	-146.0
08/19/09	5.1	2.97	425.7	-	-	-	-	8.25	-37.6	-	-	7.54	47.0
09/17/09	5.3	2.38	490.6	7.27	-91.3	6.81	-180.3	7.75	-120.2	6.85	-182.3	6.95	-24.7
09/30/09	5.0	2.96	503.7	8.03	-18.9	8.99	-253.1	7.75	-217.2	7.03	-276.6	7.98	-17.0
10/15/09	5.5	2.93	496.6	6.57	-121.4	7.63	-301.0	8.33	-148.5	7.71	-314.5	7.85	-41.2
10/28/09	4.9	2.96	487.6	8.79	-69.9	7.28	-216.4	9.08	-143.0	7.24	-162.8	7.94	2.8
11/11/09	5.0	2.91	420.8	8.34	-15.3	7.49	-243.7	8.42	-163.9	7.51	-199.3	7.74	60.6
12/17/09[5]	5.0	2.90	416.5	4.65	100.2	5.00	15.3	-	-	5.12	-1.8	5.91	-26.4
01/14/10[5]	4.8	2.85	417.7	6.96	-89.0	6.82	-186.4	-	-	6.84	-206.1	6.45	-67.4
02/02/10[5]	4.7	2.94	484.0	7.58	-46.7	6.85	-129.6	-	-	6.67	-131.1	6.95	-48.1
03/09/10	4.8	2.74	474.7	8.27	-78.3	7.95	-204.2	8.74	-208.9	8.10	-220.8	7.75	-5.9
04/26/10[6]	12.0	2.85	479.5	5.14	135.1	5.61	-19.0	5.04	109.2	5.60	-29.6	6.15	35.9
05/17/10	9.7	2.97	436.9	6.26	196.9	7.04	-283.9	7.79	-235.1	7.08	285.4	7.76	-73.8
05/24/10	9.4	3.16	418.0	7.43	-156.1	7.00	-259.9	7.27	-171.4	6.89	-282.6	7.11	-78.6
05/27/10	9.6	3.18	423.1	5.52	-225.1	7.58	-316.7	8.86	-318.2	6.74	-296.8	7.07	-98.7
06/01/10	10.5	3.11	444.0	8.47	-32.2	7.72	-292.6	9.00	-	6.74	-300.9	7.01	-31.5
06/14/10	10.0	2.99	427.7	7.40	-81.7	6.85	-272.5	8.22	-220.2	6.61	-181.6	7.48	-93.7
06/15/10	-	-	-	8.04	-221.6	6.89	-347.7	-	-	6.17	-355.9	-	-
06/16/10	-	2.99	427.7	7.40	-81.7	6.85	-272.6	8.22	-220.2	6.61	-181.6	7.48	-93.7
06/18/10	9.1	-	-	7.72	-211.7	6.79	-335.6	-	-	6.69	-336.7	-	-
06/21/10	9.0	3.21	409.4	7.99	-242.7	6.96	-364.1	7.86	-303.4	6.78	-349.5	7.70	-142.3
06/30/10	10.0	2.59	451.5	8.73	-216.2	8.73	-216.2	-	-	6.78	-337.9	7.96	-164.5
07/01/10	-	2.82	422.4	-	-	-	-	-	-	-	-	7.94	-241.9
07/13/10	10.0	2.62	479.5	7.52	-112.1	6.90	-279.5	8.02	-255.2	6.90	-294.0	7.76	-65.8
07/21/10	10.0	2.93	475.1	7.90	-70.5	7.15	-301.5	7.80	-212.4	7.27	-315.3	8.09	-95.7
07/29/10	10.0	2.90	465.3	7.73	-168.6	7.25	-318.1	7.08	-192.5	7.15	-318.5	7.06	-45.6
08/03/10	9.0	2.94	458.6	7.69	-193.3	7.16	-311.4	7.16	-311.4	7.17	-324.5	7.39	-66.3
08/12/10	9.0	2.85	476.3	7.98	-255.3	7.07	-299.3	7.50	-235.2	7.06	-307.0	7.55	-26.2
08/17/10	9.5	2.64	470.9	8.09	-47.2	7.54	-306.0	8.47	-206.8	7.37	-320.0	7.86	-74.0
08/24/10	9.2	3.04	250.0	7.81	-129.9	7.21	-151.9	7.20	-202.9	7.09	-147.9	7.81	2.9
09/02/10	9.2	2.84	503.9	7.70	-208.4	-	-	8.15	-227.0	7.32	-267.2	7.97	-20.2
09/16/10	8.0	3.21	455.8	8.40	-219.9	7.29	-209.3	8.66	-197.0	7.32	-279.7	7.76	-76.4
09/22/10[7]	8.0	3.06	476.5	8.50	-151.0	7.25	-276.9	8.30	-257.8	7.39	-279.9	7.93	-112.0
09/30/10[7]	7.6	3.16	503.3	8.49	-263.9	7.32	-265.4	8.53	-221.9	7.26	-267.8	8.61	94.1
10/06/10[8]	9.0	3.28	479.3	7.83	-287.5	7.39	-305.8	8.25	-246.7	7.62	-305.1	8.17	-235.5
10/11/10	8.0	3.20	479.3	7.52	-190.4	7.00	-284.4	8.28	-227.4	7.15	-290.4	7.85	26.4

TABLE 2
ASPEN SEEP BIOREACTOR TREATMENT SYSTEM - RECENT pH and ORP FIELD MEASUREMENTS
MARCH 2012 MONTHLY SUMMARY
Draft - Provisional Data

Date	Aspen Seep Bioreactor Influent[1]			Manhole 1 or 2 (Biocell 1 Influent)		Manhole 4 or 5 (Biocell 1 Effluent/Biocell 2 Influent)		Manhole 6 (NaOH dosing location)		Manhole 7 or 9 (Biocell 2 Effluent)		Aspen Seep Bioreactor Effluent	
	Flow (gpm)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)
10/19/10	8.0	2.89	447.3	8.75	-157.3	7.43	-310.4	8.52	-203.0	7.22	-310.6	8.15	130.4
10/28/10	8.0	2.95	579.0	7.23	-282.8	6.98	-368.9	8.50	-384.7	7.12	-402.6	7.73	-30.7
11/02/10	8.0	2.69	366.7	7.89	-285.1	7.14	-385.2	8.46	-307.5	7.00	-385.7	7.62	-31.5
11/15/10	8.5	2.94	361.7	7.79	-273.2	7.08	-381.9	8.04	-269.3	6.89	-384.5	7.64	-2.2
12/07/10[9]	8.5	3.01	387.2	6.97	-298.4	6.82	-375.1	-	-	6.57	-353.5	6.41	-112.4
01/07/11[9]	8.5	2.92	434.1	6.50	-134.0	5.98	-200.1	-	-	6.08	-216.2	6.15	-4.9
02/01/11[9]	8.0	3.07	423.8	6.75	-332.2	6.86	-279.7	-	-	6.59	-297.0	6.62	-9.3
03/11/11	8.5	3.05	384.7	7.66	-239.2	7.11	-344.7	-	-	6.85	-370.1	7.05	-73.4
4/19/11[10]	30.0	2.61	454.9	-	-	-	--	-	-	-	-	4.72	172.9
04/26/11	29.0	2.91	362.1	7.45	-199.2	6.58	-346.5	7.42	-232.8	6.41	-369.7	7.22	-144.6
05/03/11	27.0	2.90	355.0	7.70	-264.8	6.56	-361.5	7.81	-264.9	6.54	-402.2	7.60	-137.5
05/11/11	24.0	2.84	344.2	6.81	-198.2	6.31	-229.0	6.99	-200.7	6.23	-204.0	6.99	-139.2
05/20/11	17.0	3.03	372.4	8.10	-282.2	7.09	-361.8	7.89	-219.6	6.39	-367.9	7.36	-44.1
06/01/11	17.5	2.92	378.6	8.18	-175.7	7.11	-360.0	8.14	-272.8	6.55	-337.9	7.32	-50.3
6/15/11[11]	15.6	3.18	407.7	-	-	-	-	8.60	-231.3	-	-	8.15	-3.9
6/21/11[11]	14.7	3.09	415.6	-	-	-	-	8.15	-184.2	-	-	-	-
6/28/11[12]	15.0	2.95	204.5	7.66	-503.6	6.94	-581.5	8.44	-458.1	6.93	-581.5	7.52	-85.1
07/06/11	14.0	2.95	237.1	8.37	-50.3	6.98	-525.6	8.10	-382.9	6.75	-550.2	7.81	-249.1
07/13/11	13.8	2.88	352.2	8.46	-312.3	6.83	-412.1	5.43	-48.5	6.67	-420.1	7.84	-37.4
07/19/11	13.0	3.11	304.3	7.27	-462.3	6.93	-434.0	8.40	-407.5	6.85	-436.0	8.0	-86.6
07/28/11	-	2.98	320.8	8.32	-294.3	7.10	-393.6	8.55	-165.4	6.99	-376.0	7.90	-70.4
08/04/11	12.0	3.12	337.7	7.88	-416.0	7.20	-437.3	8.73	-437.5	7.11	-431.8	8.14	-155.7
08/11/11	12.0	2.85	360.2	7.72	-456.0	7.27	-421.6	8.95	-421.9	6.87	-443.0	8.04	-162.8
08/17/11	12.0	3.00	362.5	6.93	-291.8	6.84	-415.5	8.60	-338.3	6.92	-437.7	7.97	-187.8
08/24/11	12.0	3.01	362.8	6.42	-257.0	7.08	-405.5	8.30	-277.9	6.84	-402.2	7.85	-164.4
08/30/11	12.0	2.90	350.9	8.23	-321.5	7.27	-433.4	7.49	-366.0	7.05	-428.0	7.63	-63.5
09/08/11	12.0	2.98	362.2	7.66	-387.0	6.98	-405.5	7.55	-375.2	6.80	-402.3	7.91	-183.6
09/15/11	12.0	3.01	385.0	8.16	-194.0	6.97	-372.7	8.38	-359.1	6.90	-342.6	8.07	-146.1
09/23/11[11]	12.0	2.99	400.1	-	-	-	-	6.81	-142.1	-	-	8.30	-295.9
09/28/11	12.0	2.86	429.9	7.29	-312.1	6.76	-232.9	7.11	-108.4	6.71	-224.1	7.54	-131.1
10/06/11	12.0	2.96	389.0	6.73	-220.1	6.48	-281.5	6.55	-250.8	6.80	-331.8	7.01	-159.3
10/20/11	-	-	-	-	-	-	-	7.50	-375.9	6.93	-365.1	-	-
10/21/11[4]	-	-	-	-	-	-	-	3.14	416.8	6.86	-365.1	-	-
10/27/11	-	3.13	424.5	-	-	-	-	6.91	-189.7	-	-	-	-
10/28/11	11.5	2.91	375.7	7.26	-186.5	6.68	-246.5	7.41	-215.3	6.84	-265.3	7.10	-159.0
11/08/11	-	3.12	368.8	-	-	-	-	-	-	-	-	-	-
11/10/11	11.8	3.08	369.9	-	-	-	-	7.13	-213.9	-	-	-	-
11/15/11	11.5	3.08	371.9	7.89	-335.8	7.21	-223.6	7.54	-252.3	6.68	-348.3	7.14	-109.9
12/07/11	11.0	2.86	375.4	7.30	-260.8	7.01	-347.1	7.51	-387.9	6.72	-334.1	7.21	-114.9

TABLE 2
ASPEN SEEP BIOREACTOR TREATMENT SYSTEM - RECENT pH and ORP FIELD MEASUREMENTS
MARCH 2012 MONTHLY SUMMARY
Draft - Provisional Data

Date	Aspen Seep Bioreactor Influent[1]			Manhole 1 or 2 (Biocell 1 Influent)		Manhole 4 or 5 (Biocell 1 Effluent/Biocell 2 Influent)		Manhole 6 (NaOH dosing location)		Manhole 7 or 9 (Biocell 2 Effluent)		Aspen Seep Bioreactor Effluent	
	Flow (gpm)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)	pH (s.u.)	ORP (mV)
01/04/12	-	-	-	-	-	7.72	-232.2	8.13	-148.7	6.19	-344.4	7.65	-242.4
01/05/12	10.0	2.65	396.7	7.14	-406.2	8.34	-368.0	8.40	-318.9	6.16	-380.4	8.20	-31.6
02/10/12	9.0	2.70	400.0	8.60	-246.9	7.69	-248.7	-	-	7.15	-264.4	8.04	61.5
03/08/12	8.6	2.43	401.0	8.61	-301.3	8.21	-240.5	-	-	6.89	-296.8	8.47	81.3

Notes

1. Aspen Seep Bioreactor Influent Flow measurements are field measurements collected with a graduated bucket and stop watch.
2. Biocell 1 was flushed on 10/08/07, 10/09/07, and 10/18/07; Biocell 1 was bypassed during this flushing period. Low pH readings in Manhole 1 from 10/10/07 through 10/31/07 were caused by drainage into pretreatment pond from failed seal in weir box cap.
3. Measurements are believed to be erroneous due to calibration error. Parameters were re-evaluated on 02/12/08.
4. Low pH measurements due to a power outage and associated chemical pump shutdown.
5. Low pH measurements caused by stripped gears on NaOH pump head that interrupted dosing to Manhole 6 between 11/11/09 and 12/17/09 site visits.
6. Low pH measurements due to increase in system flow rates; chemical dosing rates lagged behind these system flow rate increases and were unable to prevent decrease in system pH.
7. Effluent readings were collected from the centrifuge discharge location on these dates due to sludge dewatering. Water was not being discharged from Pond 4.
8. Effluent readings were collected from the Pond 4 sample location on this date. Water was not being discharged from Pond 4 at the time of water quality measurement.
9. Low pH measurements due to power outage and associated chemical pump downtime during the inverter failure on November 29, 2010.
10. Low pH measurement due to increase in system flow rates.
11. Field measurements at intermediate bioreactor manholes were not collected when recirculation operations were interrupted due to sludge dewatering operations or biocell flushing.
12. ORP measurements may be inaccurate due to probe calibration issues.

Abbreviations

- - not measured, not recorded, or bioreactor operation did not have flow at given location on the specified date.
gpm - gallons per minute
mV - millivolts
ORP - oxidation/reduction potential
s.u. - standard unit